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Arylenesiloxane Copolymers

Arylenesiloxane copolymers, as a class, have been the subject of considerable investigation in efforts to develop organosilicon polymers (for use as adhesives, laminating resins, and coatings) having improved physical and chemical properties, including stability at elevated temperatures. These efforts have led to the preparation of new arylenesiloxane copolymers having regularly ordered structures.

The copolymers were typically prepared by heating different mixtures of arylenesilane and siloxazane monomers in a 25×140 mm polymerization tube immersed in a Wood's metal bath for a specified time (generally 8 hours at 160°C). A number of copolymerizations were also carried out in solution.

Both the arylenesilane and siloxazane monomers, which were synthesized in these experiments, were either previously unknown compounds or had not been prepared in a sufficiently high degree of purity. The arylenesilanes consisted of the following compounds: p-phenylenebis (dimethylsilanol); m-phenylenebis (dimethylsilanol); p-phenylenebis (methylphenylsilanol); m-phenylenebis (methylphenylsilanol); p-phenylenebis (diphenylsilanol); m-phenylenebis (diphenylsilanol); bis (p-dimethylhydroxysilylphenyl)

ether; and bis (p-hydroxymethylphenylsilylphenyl) ether. The siloxazanes which were synthesized included the following compounds: decamethyl-1,5-diaza-3,5-dioxa-2,4,6,8-tetrasilacyclo-octane; heptamethyl-1-aza-3,5-dioxa-2,4,6-trisilacyclohexane; and nonamethyl-1-aza-3,5,7-trioxa-2,4,6,8-tetrasilacyclo-octane.

Note:

Inquiries concerning these developments may be directed to:

Technology Utilization Officer
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Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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